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DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry

Memorandum

Date July 6, 1994

From Senior Regional Representative
ATSDR Region III

Subject Site Review and Update (SRU)
Crossley Farm/Hereford Groundwater

To Roy Schrock
Regional Project Manager, EPA Region III

Art Dalla Piazza
Hazardous Site Cleanup Manager, PA DER
Harrrisburg Regional Office

Gary Schultz, Environmental Health Specialist
Pennsylvania Department of Health

Dr. Kandiah Sivarajah,
Chief State Toxicologist
Pennsylvania Department of Health

Attached is a final Site Review and Update document on the Crossley Farm/Hereford Groundwater, Hereford Township, Berks County, Pennsylvania. This SRU was prepared by the Pennsylvania Department of Health under a cooperative Agreement with the Agny for Toxic Substances and Disease Registry (ATSDR).

Although the SRU may contain recommendations directed at the EPA an other agencies, its primary purpose is to perform a review of current site conditions and recommend further actions for ATSDR to take at the site. An extensive evaluation of available data is not done for the SRU. If an extensive evaluation is necessary based on new information obtained from you or another party, the SRU may require a revision to recommend that a health consultation or a public health assessment be performed. Although this SRU is being provided for your review, its primary intent is to inform you of the actions ATSDR will be taking at this site. A written response from you is necessary only if significant errors are noted which could change the conclusions an recommendations made in the document.

If you have questions regarding this SRU, please telephone me at 215/597-7291.

Charles J. Walters, Jr.

Attachments

AR300067

Site Review And Update

CROSSLEY FARM/HEREFORD GROUNDWATER

HEREFORD TOWNSHIP, BERKS COUNTY, PENNSYLVANIA

CERCLIS NO. PAD981740061

JUNE 29, 1994

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Site Review and Update: A Note of Explanation

The purpose of the Site Review and Update is to discuss the current status of a hazardous waste site and to identify future ATSDR activities planned for the site. The SRU is generally reserved to update activities for those sites for which public health assessments have been previously prepared (it is not intended to be an addendum to a public health assessment). The SRU, in conjunction with the ATSDR Site Ranking Scheme, will be used to determine relative priorities for future ATSDR public health actions.

SITE REVIEW AND UPDATE

CROSSLEY FARM/HEREFORD GROUNDWATER

HEREFORD TOWNSHIP, BERKS COUNTY, PENNSYLVANIA

CERCLIS NO. PAD981740061

Prepared by:

Pennsylvania Department of Health
under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

SUMMARY OF BACKGROUND AND HISTORY

The Crossley Farm (Hereford Groundwater) site is in Hereford and Washington Townships, Berks County, Pennsylvania. A plume of contaminated groundwater containing volatile organic compounds (trichloroethene (TCE) and tetrachloroethene (PCE)) originates on an active farm near Huff Church (Figures 1 and 2) and extends southward beneath the valley of Perkiomen Creek into Washington Township and past the little town of Dale (Figures 2 and 3). The total plume length, based upon residential well sampling, is about 14,000 feet (2.6 miles). About forty homes and a mobile home park with thirty-eight units are and have been affected by the plume. About 13 private wells with total volatile organic compound levels above 150 parts per billion (ppb) have been fitted with carbon filtration units furnished by the Environmental Protection Agency (EPA). Filters are changed about twice yearly. It is not known to what extent other contaminated wells are equipped with treatment apparatus.

Residents expressed concern over short-and long-term exposure to TCE and PCE through contaminated wells. TCE levels near and above 20,000 ppb in two domestic wells were reported in the mid-1980s. The maximum time interval of exposure was estimated through historical documents and personal interviews to be about twenty-five years.

In March 1992, the Pennsylvania Department of Health (PADOH) and the Agency for Toxic Substances and Disease Registry (ATSDR) visited the site and the community and held a township meeting in Hereford to talk with interested area residents. ATSDR representatives explained the National Exposure Registry and the process of bringing exposed individuals into the TCE Subregistry. In the days following the meeting, some area residents thought to have suffered the highest exposure to TCE through well water were added to the Registry.

On March 18, 1992, in connection with the total scope of health activities related to the site, ATSDR and PADOH conducted a two hour presentation to the Berks County Medical Society. The topic of the presentation was TCE contamination of environmental media at the several NPL sites in Berks County and the toxic effects of TCE on humans.

A preliminary public health assessment for Crossley Farm/Hereford Groundwater was finalized on February 1, 1993. The Assessment concluded that the site presented an urgent public health hazard. The following recommendations were made:

1. Provide residents whose water supplies exceed 5 ppb TCE with appropriate treatment systems, or an uncontaminated alternative water supply.

2. Expeditiously remove the existing waste pile north of the quarry.

3. Restrict public access to the parts of the site where dumping is occurring.

4. Design a monitoring well network to define the contaminant plume, including the area around and downgradient of the dump site.

5. Perform a soil investigation in the dump area after the waste pile is removed.

6. Sample all residential wells and springs along Perkiomen Creek between the mobile home park and Barto.

PUBLIC HEALTH IMPLICATIONS

Trichloroethene (TCE)

TCE was detected in residential well water at a maximum level of 22,857 μg/L. Oral exposure to this level of TCE would result in a daily child dose of TCE that would be about three times greater than ATSDR's intermediate oral Minimal Risk Level (MRL). Therefore, noncancerous adverse health effects may occur in some children exposed to these levels.

Humans have reported health effects when exposed to the level of TCE at which its odor is noticeable. In one study, a human population was exposed to TCE in drinking water and had increased numbers of congenital heart defects (3). While it is not conclusive, it is possible that exposure to TCE in the drinking water may adversely affect the developing fetus. Furthermore, exposure to TCE at high levels has been implicated in neurological damage to facial nerves and has been associated with cardiac arrhythmias (3).

Carcinogenic effects of TCE in humans have not been conclusively demonstrated. Several studies have indicated an association between leukemia and drinking water contaminated with organic chemicals including TCE. However, a direct relationship between TCE and the increased rates of leukemia could not be determined because of multiple chemical exposures and other study limitations (3). Because of the inconclusiveness of these studies, EPA is conducting more investigations to determine TCE's cancer classification.

In a review of EPA's most recent database of assessments of carcinogens (IRIS), PADOH found that EPA has withdrawn its cancer slope factor used to estimate the cancer risk from exposure to TCE over a lifetime (70 years) of exposure. Therefore, PADOH did not conduct a cancer risk assessment for residents' exposure to TCE.

Tetrachloroethene (PCE)

The human health effects of drinking water with low levels of PCE over a long period of time are not known (4). For noncancerous effects, EPA has developed a Reference Dose (RfD) of 0.01 mg/kg/day for PCE based on animal studies that demonstrate hepatotoxicity and weight gain of animals orally exposed to PCE. If children were exposed to PCE at a

level of 224 μg/L, which is the maximum level found in residential wells, then the RfD would be exceeded by a factor of about 2. Therefore, potential exists for noncancerous adverse health effects to occur in some children exposed at this level.

PCE is classified as "reasonably anticipated to be a carcinogen" by both the U.S. Department of Health and Human Services (DHHS) and the International Agency for Research on Cancer (IARC) (4). EPA has it under consideration for placement into either the "probable human carcinogen" or "possible human carcinogen" category. In a review of EPA's most recent database of assessments of carcinogens (IRIS), PADOH did not find a cancer slope factor used to estimate the cancer risk from exposure to PCE over a lifetime (70 years) of exposure. Therefore, PADOH did not conduct a cancer risk assessment for residents' exposure to PCE.

CURRENT CONDITION OF SITE

On April 26, 1994, J. E. Godfrey and Bill Schmeer of PADOH visited the site and downgradient areas with an EPA representative. The site has changed very little since the public health assessment was written. Notably, the garbage dump area is still being used to dispose of miscellaneous waste, including spent containers of petroleum products and solvents. There is no evidence that tire piles and other debris near the quarry have been even partly removed.

An EPA contractor monitors selected wells approximately quarterly.

A new home with a private well is nearing completion at Airport and Forgedale Roads (Figures 3 and 5). The well is very near a mapped geologic fault downgradient of the disposal area and is expected to be highly contaminated with TCE/PCE (perhaps 1,000 ppb). PADOH does not yet have data on this well.

Names on mail boxes and numerous "For Sale" signs in the area indicate that several properties have changed ownership (or will change ownership), potentially exposing a new population to contaminated groundwater.

Conclusions stated in the original public health assessment remain valid. The limited groundwater data given to PADOH since 1993 indicate very little change in contaminant concentrations. Wells near the TCE source area still indicate TCE/PCE levels of several thousand ppb.

CURRENT ISSUES

The two primary public health concerns are (1) exposure to contaminated groundwater through new wells drilled in the plume, and (2) the chronic low level exposure from wells supplying water with TCE/PCE below EPA's "action level." In the latter case, some residences may have no water treatment at all, or the effectiveness of the treatment they have purchased for themselves is uncertain.

Directly related to the above exposure scenarios is the on-site waste pile, which is probably helping to maintain the contaminant concentrations in the plume. PADOH is not aware of any community concerns posed since March 1992 when ATSDR and PADOH held meetings with community members and the Berks County Medical Society. Concerns expressed at that time were discussed one-on-one or addressed in the preliminary public health assessment.

CONCLUSIONS

The Crossley Farm Site remains a public health hazard to area residents. Only one recommendation in the public health assessment was followed. Domestic wells, and apparently some springs between the site and Barto have been sampled. The PADOH hydrogeologist documented the site status (pertaining to recommendations) in a letter to ADSDR dated June 10, 1993. Site conditions have not changed noticeably since that date.

RECOMMENDATIONS

The recommendations in the preliminary public health assessment and in section one of this document are continued. According to EPA, a complete Remedial Investigation (RI) is forthcoming. Following the completion of the RI, either a health consult or another site review and update should be performed.

Special care should be taken to assure that all new wells downgradient of the site are included in the sampling program. Filtration/treatment may be required for some of those wells.

DOCUMENTS REVIEWED

1. USEPA. 1988. Regional Hydrogeologic Investigation, Town of Hereford site, Berks County, Pennsylvania.

2. U.S. Department of Health and Human Services, Public Health Service. 1993. Preliminary Public Health Assessment for Crossley Farm/Hereford Groundwater, Hereford Township, Berks County, Pennsylvania.

3. ATSDR. 1993. Toxicological Profile for Trichloroethene (Update), U.S. Public Health Service, Atlanta, Georgia.

4. ATSDR. 1993. Toxicological Profile for Tetrachloroethene (Update), U.S. Public Health Service, Atlanta, Georgia.

PREPARERS OF REPORTS

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FIGURES

FIGURE 1

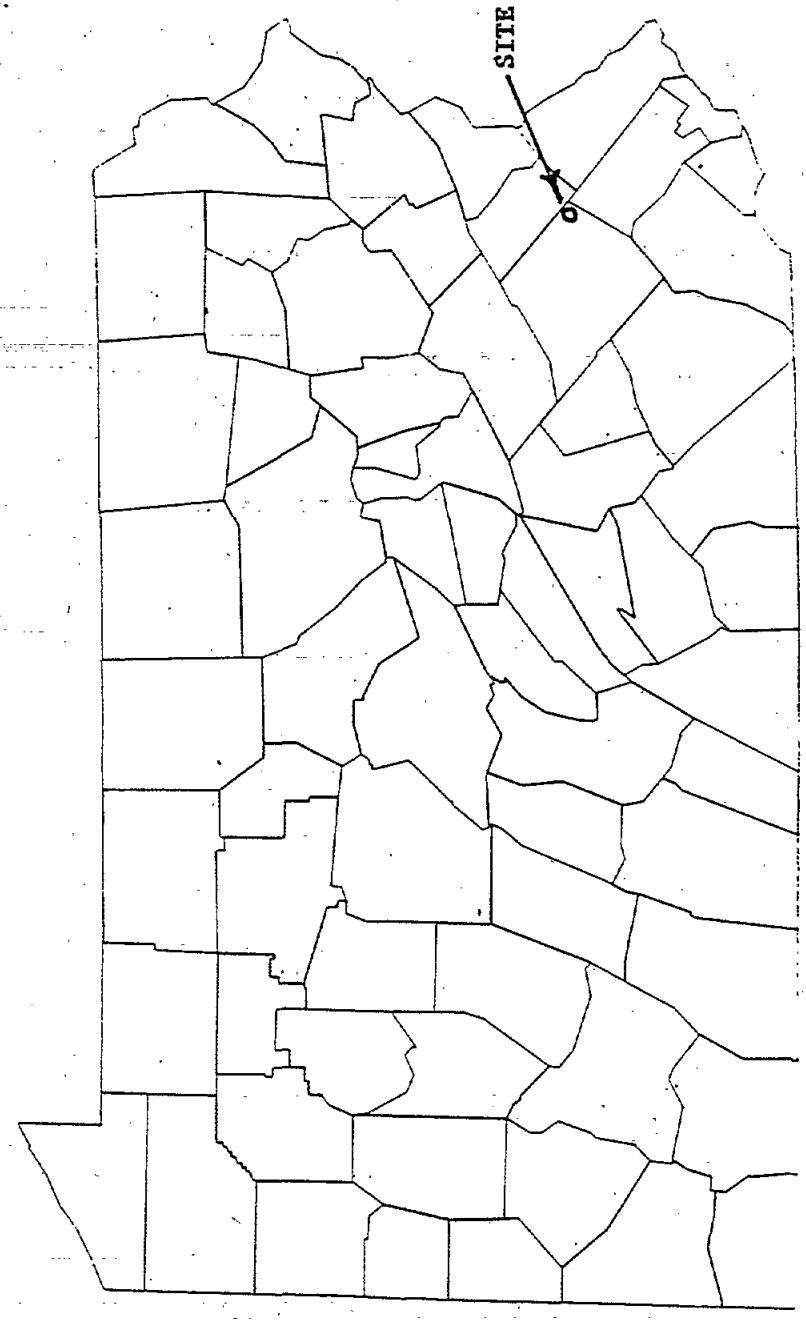
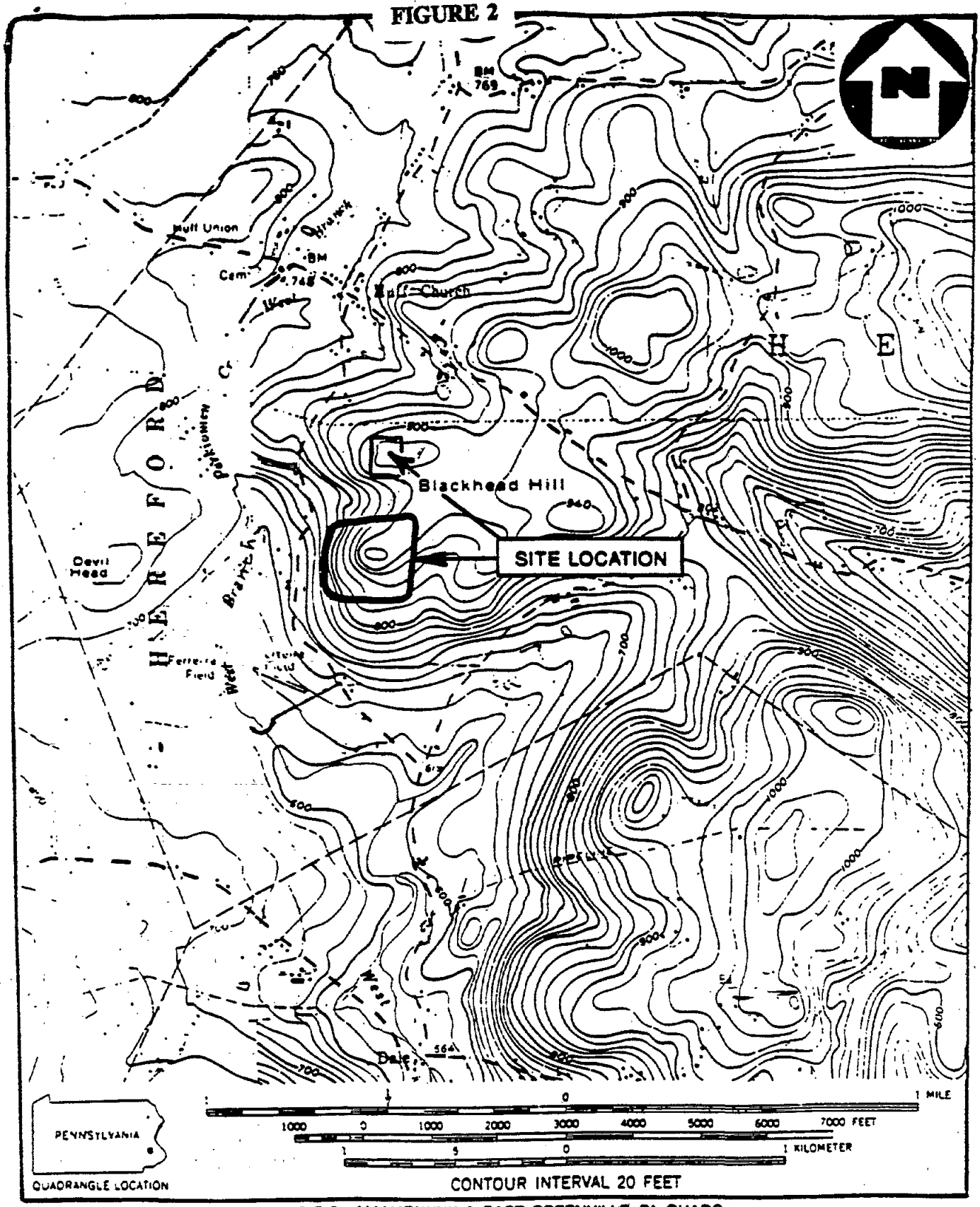


FIGURE 2



SOURCE. (7.5 MINUTE SERIES) U.S.G.S. MANATAWNY & EAST GREENVILLE, PA QUADS.

SITE LOCATION MAP

CROSSLEY FARM SITE, BUCKS CO., PA

SCALE 1: 24000

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FIGURE 3

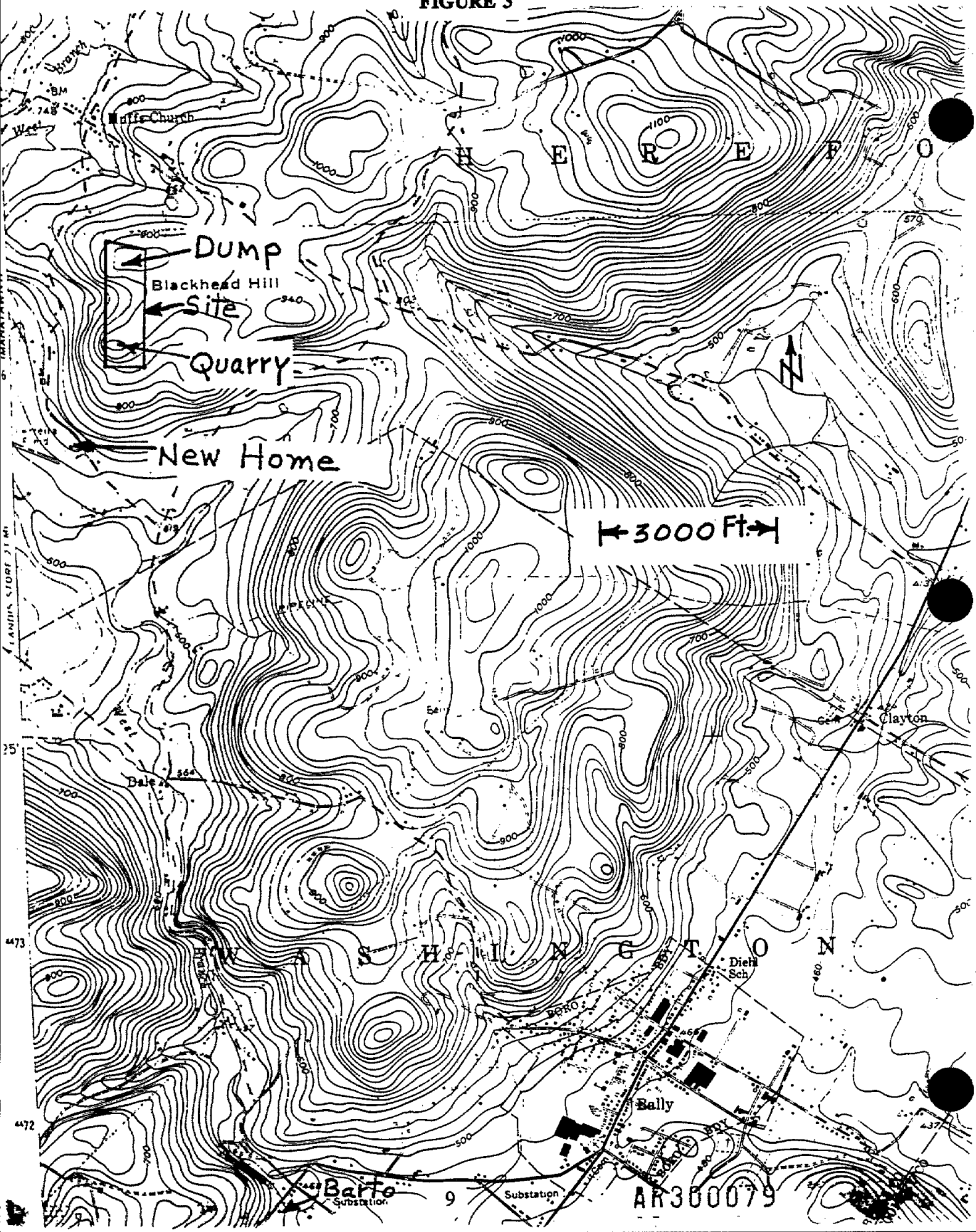
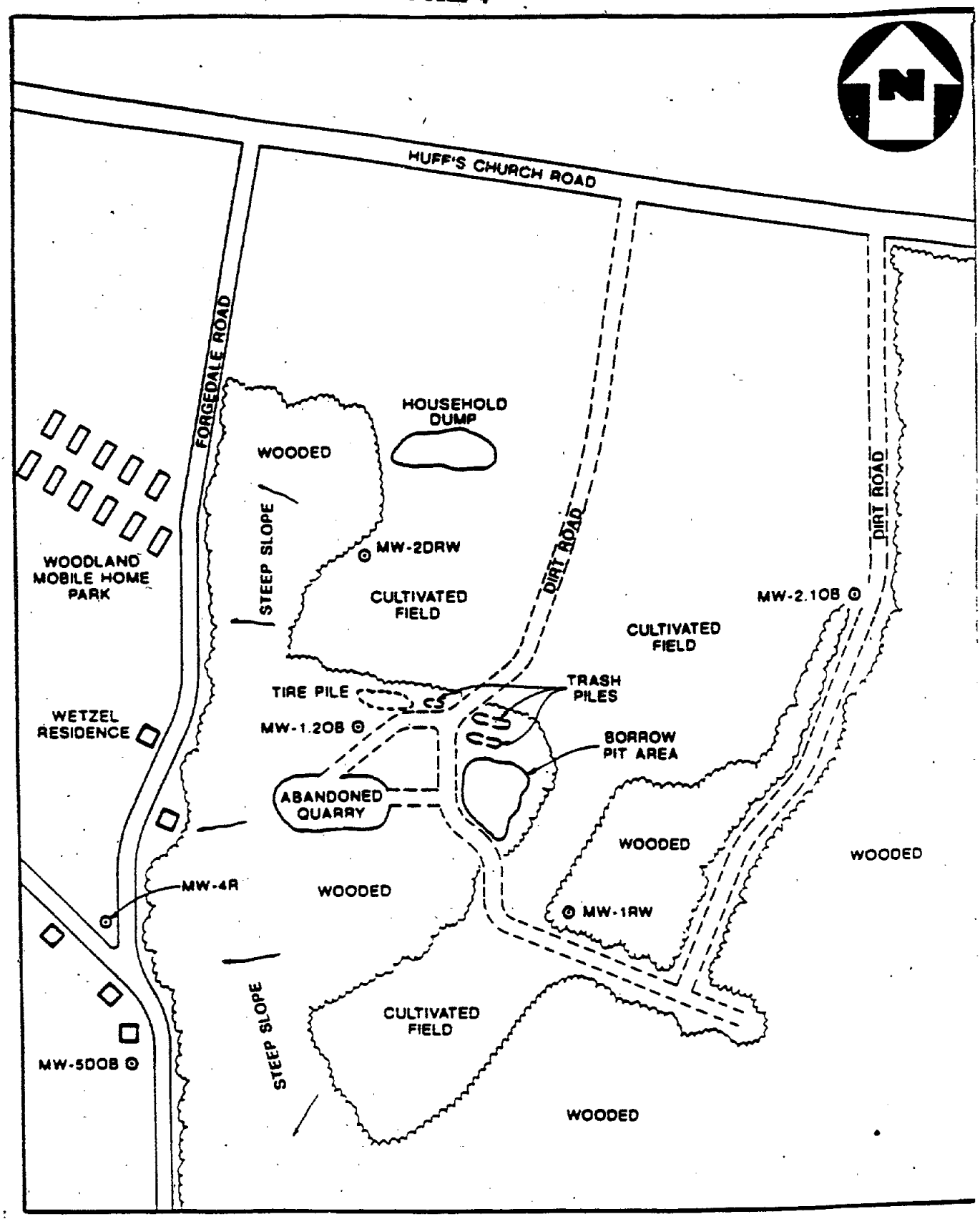


FIGURE 4



SITE SKETCH

CROSSLEY FARM SITE, BUCKS CO., PA

(NO SCALE)

NUS CORPORATION

FIGURE 5

PROJECT AREA GEOLOGY